

# Source Water Assessment Program (SWAP) Report

## For

### Sanderson Academy



Prepared by the  
Massachusetts Department of  
Environmental Protection,  
Bureau of Resource Protection,  
Drinking Water Program

Date Prepared:  
March 29, 2001

**Table 1: Public Water System (PWS) Information**

<i>PWS NAME</i>	<b>Sanderson Academy</b>
<i>PWS Address</i>	<b>808 Cape Street</b>
<i>City/Town</i>	<b>Ashfield, Massachusetts 01330</b>
<i>PWS ID Number</i>	<b>1013001</b>
<i>Local Contact</i>	<b>Principal, Ms. Anne Marie Mislak</b>
<i>Phone Number</i>	<b>413-628-4404</b>

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1013001-01G	255	640	Moderate

#### What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

#### Maintaining Your Good Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

## INTRODUCTION

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting or storage, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

#### Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to you or your community.

#### This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attached Map of the Protection Areas

## 1. DESCRIPTION OF THE WATER SYSTEM

#### Well #1

Sanderson Academy has a total staff and student population of approximately 250 people and is located in a rural setting surrounded primarily by woodland, wetland, rural residential and agricultural land uses. Well 1 is the sole source of water for the school. The well is located on a wooded parcel of land, approximately 700 feet south of Spruce Corner Road and 1,100 feet west of Route 112. A brook and wetland are adjacent to the well with a fire pond approximately 200 feet from the well. The Zone I protective radius for Well #1 is 255 feet and the Interim Wellhead Protection Area (IWPA) radius is 640 feet. The well was developed and tested under the DEP's New Source Approval Process in 1995 at a pumping rate of 10 gallons per minute (gpm). The Zone I and IWPA protective radii are based on the well's approved safe yield of 7.5 gpm (10,800 gallons per day). Please refer to the attached map that shows the Zone I and IWPA.

### What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

### What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Well #1 is a 6-inch diameter well drilled to a final depth of 380 feet with steel casing grouted from ground surface to 105 feet below ground; 23 feet into solid bedrock. Bedrock was encountered 83 feet below ground however the drilling logs do not describe the nature of the overburden material drilled through before hitting the bedrock. Bedrock geologic mapping of the area indicates the bedrock is micaceous, quartz/quartzite schist of the Goshen Formation, and that the site is close to the contact between the Goshen and Waits Formation, which is also schist. The pump is set approximately 310 feet below ground. The driller recorded water-bearing zones at 111 feet, 169 feet and 289 feet below ground; under static (non-pumping) condition water freely flowed out of the top of the casing. Following completion of the well, a hole was drilled in the side of the casing to allow the overflow to freely flow out onto the ground. Recently a pitless adapter and casing drain were installed to eliminate the free flowing water onto the ground. The ground around the wellhead was raised and graded away from the casing to eliminate ponding of water near the wellhead. The School has applied for and received a Wellhead Protection Grant from the Department to install a wellhouse and fencing around the wellhead to prevent access and conduct other system modifications.

The sanitary seal around the wellhead, the relatively deep overburden and the flowing artesian condition of the well provide some protection from potential surface sources of contamination. However, there is no evidence of a clay layer or significant barrier to contaminants. Bedrock wells drilled in these conditions are considered to be moderately vulnerable to potential contamination from the ground surface.

### Water Quality

The Sanderson Academy well water does not require and does not have treatment at this time. For current information on monitoring results, please contact the Principal, Ms. Anne Marie Mislak listed above.

## 2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are very few land uses and activities within the drinking water supply protection areas that are potential sources of contamination. The school's current operator is diligent in monitoring activities that may pose a threat to the school's water supply. The water source for the school is generally well protected. Please refer to Table 2.

**Table 2: Activities within the Water Supply Protection Areas**

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
School	Agricultural activities	No	Yes	Moderate	Haying and cattle grazing within the IWPA has minimal threat to the water quality provided they are properly managed. Monitor activities.
	School and Recreational Activities	No	Yes	Low	Continue policy of no fertilizer or pesticide usage. Passive recreation.
Highway Department	Covered Municipal Salt Shed	No	No	Moderate	Although the shed is outside of the IWPA, runoff may flow past the well.

\* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - [www.state.ma.us/dep/brp/dws/](http://www.state.ma.us/dep/brp/dws/).

## Glossary

**Zone I:** The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

**IWPA:** A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

**Zone II:** The primary recharge area defined by a hydrogeologic study.

**Aquifer:** An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

**Hydrogeologic Barrier:** An underground layer of impermeable material that resists penetration by water.

**Recharge Area:** The surface area that contributes water to a well.

Key issues include:

1. Agricultural activities
2. The Town's Salt Shed is topographically upgradient from the well

Currently, there are no non-conforming activities within the Zone I. The overall susceptibility ranking of the well to contamination is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA.

1. **Agricultural activities** – The wet meadow, south and east of the well is hayed and sometimes used for animal grazing. Haying poses minimal threat to the water quality, provided that no fertilizers or soil enhancers are used. Although, animal grazing poses a more significant potential threat, animals are kept outside of the Zone I and surface water drainage from the wet meadow flows away from the well.

✓ **Recommendation** - The school must be diligent in ensuring grazing is kept outside of the Zone I and buffers are maintained along the surface waters to protect water quality.

2. **Town's Salt Shed** – The aerial photograph (map) attached to this report was taken in 1997. Therefore the salt shed does not appear on the photograph. The shed is located south of the well, just outside of the IWPA at the end of the long driveway that does appear on the map.

Although the salt shed is covered and the tarmac is paved, there is no drainage control at the facility. The site visit for the assessment was conducted in the winter, and significant runoff from the site was observed flowing off of the tarmac toward the wetland to the north. The potential threat from the covered salt shed would be minimal provided the runoff from the site is controlled. However, the current conditions pose a potential threat to the well from runoff. Additional concern regarding the facility comes from the potential storage of vehicles or equipment at the facility. Release of hydraulic fluid, fuel or other petroleum products from the loaders and sanders should be monitored and controlled. Careful consideration must be made of the activities conducted within the IWPA and adjacent land that may impact the well.

✓ **Recommendation** - The IWPA provides interim protection for a water supply well but the actual recharge area to the well may be significantly larger or smaller. Therefore, the Town should carefully consider the activities conducted in the vicinity of the well, prohibit those that pose a significant threat to the public water supply and use Best Management Practices and controls for those activities that are allowed in this area.

The Department can offer technical assistance to the Town to determine what types of activities should be prohibited and/or controlled within close proximity to the well and the Best Management Practices that should be employed for those activities that will be allowed.

Other activities noted during the assessment:

A small portion of the school and recreational fields are within the IWPA of the well. Generally, schools pose a moderate threat. However, due to the distance from the well, the fact that no

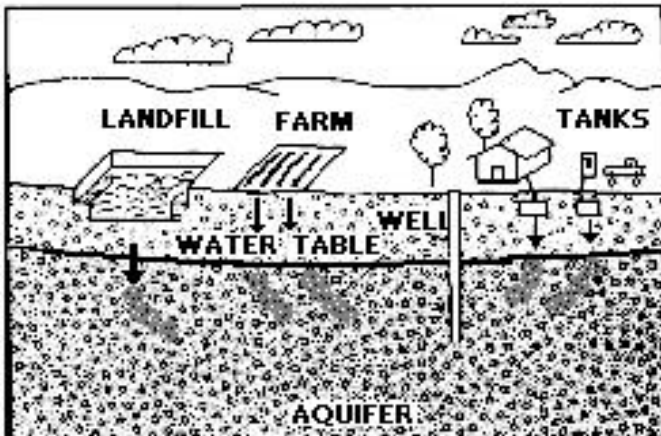


Figure 1: Example of how a well could become contaminated by different land uses and activities.

### **For More Information:**

Contact Catherine V. Skiba at DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:  
[www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws).

Copies of this assessment have been provided to the water supplier, town boards, the town library and the local media.

fertilizers or pesticides are used on the lawns, the relatively thick overburden and (static) upward gradient in the aquifer, the recreational activities represent a low potential threat to the well.

There is also low-density, residential use within the vicinity of the school well. In general, normal residential activities pose a low threat to public and private water supplies. The use of best management practices minimizes the potential threats to both private and public wells. Therefore, the Town should encourage and educate Town residents in the judicious use and management of pesticides and petroleum products, maintenance of septic systems and management of animal manure.

Implementing the following recommendations will help minimize the system's susceptibility to contamination.

### **3. PROTECTION RECOMMENDATIONS**

The Sanderson Academy and Town of Ashfield should review and adopt the following recommendations.

#### **Zone I and IWPA:**

- ✓ Secure the wellhead area with a fence.
- ✓ Contain or control all materials that could pose a potential hazard to public water supplies.

- ✓ Control the runoff from the salt shed.
- ✓ Restrict animal grazing to outside of the Zone I and maintain buffers along wetlands and waterways. Attached are several fact sheets regarding pasture and manure management. Although these fact sheets were prepared primarily for family or hobby horse owners, the information is general in applicability.
- ✓ Work with the Selectmen, Board of Health and Planning Board to monitor land uses within and proximal to the IWPA. Refer to the Wellhead Protection Plan guidance and the model bylaws for types of activities that should be prohibited and managed in the vicinity of public or private water supplies.
- ✓ Post drinking water protection area signs at key visibility locations of the Zone I.
- ✓ Keep all non-water supply activities out of the Zone I.
- ✓ Continue to conduct regular inspections of the Zone I and IWPA. Look for illegal dumping and evidence of vandalism.

#### **Training and Education:**

- ✓ Train staff on proper hazardous material use, storage, use, disposal, emergency response, and best management practices. Include custodial staff, groundskeepers, certified operator, and food preparation staff in the training. To learn more, see the hazardous materials guidance manual at [www.dep.state.ma.us/dep/bwp/dhm/dhmpubs.htm](http://www.dep.state.ma.us/dep/bwp/dhm/dhmpubs.htm). Also contact Hilary Eustace of the Massachusetts Office of Technical Assistance at 617-626-1061 or [Hilary.Eustace@state.ma.us](mailto:Hilary.Eustace@state.ma.us).
- ✓ Arrange to have potentially hazardous materials (i.e. floor stripping residuals) disposal available for the school staff, primarily the custodial staff, either through the Town's hazardous waste collection days or through other means. The school may have to register as a Very Small Generator of Hazardous Waste to dispose of small quantities of hazardous materials.
- ✓ Incorporate groundwater education into the school's curriculum (K- Grade 6 curricula available from DEP; DEP can suggest other agencies' curricula as well).

#### **Facilities Management:**

- ✓ Implement standard operating procedures regarding proper storage, handling, use and disposal of potentially hazardous materials.
- ✓ Septic system components should be inspected and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Due to the age of the school it is highly improbable that PCBs are present, however the fluids required in the transformers are oils. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

**Planning:**

- ✓ Work with local officials in Ashfield to assist you in improving and maintaining protection of the school's water supply.
- ✓ It is recommended that the Town consider zoning bylaws to protect the public water supply area for the school. Refer to the Department's model bylaws for examples of activities that should be prohibited within the Wellhead Protection Areas and those that should be restricted or controlled. Utilize BMPs where appropriate.
- ✓ Prepare a Wellhead Protection Plan and Emergency Response Plan to address short-term water shortages, long-term water demands and management. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional, new information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion to promote local drinking water protection measures for all public and private water supplies.

**Attachments:**

- Map of the Public Water Supply (PWS) Protection Area.
- Septic System Brochure
- Developing a Local Wellhead Protection Plan
- Summary of Recommended Source Water Protection Measures
- The Very Small Quantity Generator of Hazardous Waste – Fact Sheet
- One Day Hazardous Waste Collections - Fact Sheet
- Fact Sheets – References for pasture and manure management

**Additional Reference Documents:**

To help with source protection efforts, more information is available from the Regional Office by contacting Catherine V. Skiba (413) 755-2119 or online at [www.state.ma.us/dep/brp/dws](http://www.state.ma.us/dep/brp/dws), including:

- Water Supply Protection Guidance Materials such as model regulations,
- Best Management Practice information, and general water supply protection information.
- MA DEP SWAP Strategy
- Land Use Pollution Potential Matrix
- Draft Land/Associated Contaminants Matrix